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Chapter 12

Breaking Ground: Constructing Authentic Reading-Writing Assessments for Middle and Secondary School Students

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When examining student achievement on writing assessments, particularly large-scale writing assessments such as the National Assessment of Educational Progress (NAEP) or state-level writing assessments, it is apparent from the results that such assessments are problematic for many students. The 2002 NAEP (National Center for Educational Statistics [NCES], 2003) showed 72% of fourth-grade students performed at or below the Basic level of achievement, and that by eighth grade, the students still did no better. Moreover, only 28% of fourth graders and 31% of eighth graders performed at or above the Proficient level. These writing assessments measure two distinct, albeit highly related, abilities: (1) reading comprehension and (2) transforming comprehension into composition.

The goal of this chapter is to propose a theoretically grounded and empirically tested method to design, administer, and evaluate an authentic writing assessment for students in the late elementary grades and beyond. We present this method from the perspectives of researcher, teacher, and student. Rather than a linear view of the transmission of curriculum, instruction, and assessment design—researchers to teachers to students, with little interaction—we take a collaborative-reciprocal or reflective approach. Researchers, teachers, and students interact with one another within a concentric circle, where a dynamic development process replaces the separate stages for designing, administering, and grading. In this process, teachers become “reflective practitioners,” inquisitive of their own practice and responsive to the particularities of the classroom (Schön, 1983, 1987). For students, learning mirrors teaching, demonstrated by the use during assessment and instruction of metacognitive strategies, or thinking about thinking.

In the chapter, we first focus on the linkage between comprehension and composition, between reading and writing. For the grade levels considered here,

authentic classroom projects call for the translation of students' ideas and cognitions, garnered from various sources, into written text that transforms those ideas and cognitions into new constructions. Theoretical bases for these tasks rest on schema theory and the reading-writing connection (Anderson, Spiro, & Anderson, 1977; Nelson & Calfee, 1998). Next, we examine the importance of informing teachers and students about text analysis and rhetorical structure (often overlooked components of reading instruction) as strategies to support reading comprehension and effective writing. Against this context, we then present practical, hands-on suggestions for constructing an authentic assessment—start to finish—including characteristics of appropriate reading samples (target texts) that can serve as the basis for writing assessments, creation of reading-writing prompts, and support for the move from reading to writing.

Schema Theory and Reading Comprehension

What does research have to say about reading comprehension? A RAND Corporation reading study group (Snow, 2002) approached this question to set the stage for a research and development program aimed toward increasing K-12 reading comprehension. The report begins on the pessimistic note that “the current knowledge base on reading comprehension...is sizable but sketchy, unfocused, and inadequate as a basis for reform in reading comprehension instruction” (p. xii). The group then proposes a tripartite conceptualization of reading comprehension: the reader, the text, and the activity or purpose for reading. In its review of comprehension assessments, the reading study group finds fault with current methods when viewed through this framework; rather than operationalizing reading comprehension as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language,” current instruments “conflate comprehension with vocabulary, domain-specific knowledge, word reading ability, and other reader capacities” (p. 53).

We are more optimistic about the conceptual and empirical foundations in the field, although we share the criticisms of current assessment strategies. Our reason for optimism springs from the work of the Illinois Center for the Study of Reading (CSR). Although remarkably few of the center's findings can be found in current practice, the CSR has produced valuable studies in the comprehension area for more than 25 years. The hallmark of the CSR work falls under the label of *schema theory* (e.g., Adams & Collins, 1977; Anderson, Spiro, & Anderson, 1977; Armbruster, 1976), with origins in cognitive models, later expanded to incorporate social-constructivist elements.

At the center of schema theory is the notion that understanding a complex message depends on instantiation by the comprehender of a template, or schema, that serves as a tentative framework for organizing the incoming information. Consider the following passage, used in research projects as a prototypical illustration of the importance to the reader of connecting with an appropriate schema:

The procedure is actually quite simple. First you arrange the pieces into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities, then that is the next step. Otherwise you are ready to go. (Bransford & Johnson, 1973, p. 400)

Several other paragraphs follow this introduction, leaving most “readers” thoroughly confused about the message. What is the problem? The vocabulary is familiar to most adults. The sentences are not especially long or complex. The problem is that the reader cannot connect to a familiar schema—what is the passage about? In this instance, a connection is easily established by suggesting that the reader think about doing laundry. Suddenly the text clicks—words and sentences fit together, the reader can anticipate upcoming material, and assessments show that the message has been understood.

A substantial body of research (Anderson, Spiro, & Anderson, 1977) supports the basic idea that comprehension of new material depends on connections to existing knowledge and previous experiences. But similar to 19th-century phenomenology, which captured audiences’ attention with vivid examples, schema theory left important questions unanswered: What elements and dimensions are essential in defining a schema? What processes link a new text to an existing schema? How are schemata created and transformed? The examples typically relied on concrete experiences (doing laundry, going to a restaurant) that entailed shared commonplaces, or on “scripts” (fairy tales, fables) also commonplace but more generalizable; “heuristics” appear as a strategic version of the concept. The schema construct nonetheless provides a powerful foundation for reflecting on both comprehension and composition. To understand (or construct) a text, the individual relies on an existing memory template, which provides “slots” into which information can be placed, and that establishes tentative relations among existing and incoming elements. The linking process is dynamic, as shown by garden-path studies where the reader is led to instantiate an inappropriate schema, and must then move the information from one framework to another. In a favorite study of cognitive researchers, the reader is led to believe that the text is about a burglary, and then realizes at the end that it’s a wrestling match; short story writers such as Guy de Maupassant use the same technique to startle readers. A similar conceptualization applies to the writing process, where an author chooses a particular framework to guide the assembly of a set of elements, which then serves to begin the composing activity. But we have all had the experience of stopping midway through a work with the often-distressing realization that we need to reframe the argument.

For present purposes, we will rely on two related concepts to extend and particularize schema theoretic notions: *text structure* and *latent semantic analysis*. Text structure concepts emerged during the CSR heyday as a substantial line of research and development (for an overview, cf. Chambliss & Calfee, 1998). Also driven by cognitive and social-constructivist notions, the idea was that written texts are more than collections of words and sentences. “Written” was an important determiner because the structure of casual conversations was less obviously the result of purpose, construction, revision, and permanency. A text, whether oral or written, resulted from the writer’s or speaker’s application of design principles.

While an oversimplification, the division of texts into narrative and expository categories provides a useful first cut for academic purposes. Story grammars (Stein, 1978) captured the universal human capacity to grasp slices of life, ranging from jokes to fairy tales to *Heart of Darkness* (Conrad, 1899/1999). The underlying elements are familiar territory—character, plot, setting, and theme. Human beings are remarkably adept at making sense of story “stuff” if they can fit a few elements

into the basic story schema, whether it is a child's story or Joyce's *Ulysses* (1922/1990).

Expository or informational texts, generally associated with formal communication, build on a collection of schemata that emerge not through natural development, but as societal artifices. The instantiation of extended structures, such as research reports, newspaper articles, and op-ed pieces, comes not from casual conversation but academic activities. The textbook, a daunting challenge for most readers, exemplifies the concept. For novices, the topic is unfamiliar, the cognitive schema has yet to be established, and the writing style is unfriendly. One of the primary outcomes of formal education is to support the creation of abstract schemata, along with detectors that alert the individual that the incoming message is not a simple story but requires genuine comprehension—the origins of which condense to “wrestling with ideas.” When a speaker announces, “Let me lay out the three points that frame this presentation,” you know she is not going to tell a story and that you should establish three slots in working memory to capture the three points. Before long, “three points” will be a schematic structure in long-term memory.

Text structures have their foundations in rhetorical principles but are also increasingly related to the application of graphic organizers (Chambliss & Calfee, 1998). The latter can serve several functions. One is the use within a text to lay out text structure. For example, a matrix displays three muscle types crossed with critical features, providing a summary of the textual content. A second provides the reader a way to create a visual summary of a complex text; if the writer did not provide a matrix for the muscle text, then the reader can construct one. In writing, organizers can set the stage for the design of a composition and serve as a framework for organizing information. If the task is to prepare a paper on muscles, then a matrix serves to display the results of various explorations in preparation for writing.

Text structures are inherently abstract, but comprehension eventually comes down to linking words and ideas—to establishing associations. During the past decade, a new set of conceptualizations and procedures has emerged around the notion of semantic space (Landauer, 1999). The origins of this work arise from efforts to define a “concept”—what does a person understand in response to *dog*, *house*, or *snowflake*? Viewed as a vocabulary matter, the question often centers on responses to a stimulus, following associative traditions. But the question also touches on schema theory; what comes to mind when you think about *restaurant*? A template emerges for most of us, which can be fleshed out more completely by suggesting labels like McDonald's or New York's Four Seasons. Finally, concepts can be connected to text structure. A primary aim of courses in physics and government is to (re)shape the individual's semantic space in the content domain. For instance, consider how adolescents define and interrelate the following words prior to a course in mechanics: *speed*, *force*, *accelerate*. They have some familiarity with this vocabulary, but as they make their way through the physics text (and other course-related experiences), they construct new schemata and transform existing ones.

Research on latent semantic analysis (Landauer, 1999) captures conceptual maps through a computer-based procedure (Intelligent Essay Assessor, or IEA) that constructs a student's associative structure following experience with a target text through analysis of a composition written in response to the text. Practically speaking, the procedure begins by providing IEA with a target text, along with a

large collection of student essays written in response to the text. For instance, the target input might be a chapter on human memory from an introductory psychology textbook; additional input comes from responses to exam questions on the chapter, including the grade for each exam. The “word” is the foundation for IEA analysis, where “word” is operationalized as a physical entity (written or spoken) along with all the conventional associative correlates. Practically speaking, IEA uses a standard thesaurus as a guide, so it “knows” that *dog*, *hound*, *mutt*, and *pooch* refer to the same concept. IEA “digests” this body of material, including the chapter and the graded responses, and generates an associative “kernel,” a multidimensional nugget that incorporates the critical conceptual relations in a compact package. The associative core features the textbook information along with the compositions that receive high grades, but the model also includes information about departures from the ideal.

Once a core has been constructed, IEA can be used to grade new sets of essays, including responses not only to previous questions but also new ones. The intro psych instructor can ship off a collection of student essays on human memory to the IEA website, and will quickly receive ratings and comments about each essay, based on the match of each essay to the kernel generated from the previous inputs. Automated and responsive grading is the primary practical application from the IEA system. From our perspective, a more interesting question centers around the nature of the kernels generated for a particular topic. What does IEA, using latent semantic analysis as the foundation, produce as the package that represents near-ideal understanding of a particular text? What is the relation of this associative network to corresponding schemata and text structures? Exploration of these issues using IEA as a foundation both conceptually and practically holds promise for the design and assessment of students’ capacity to collect, analyze, and organize a complex body of information, and then transform the material into a novel construct—the kinds of tasks that become more essential as students move through the middle school years and beyond. Valid assessment of students’ competence as academic writers begins with the acquisition of a clearly defined knowledge base rather than sole reliance on personal experience, which can vary substantially and inequitably. The most appropriate foundation for an academic writing assessment thus begins by presenting the candidate with a target text designed around a clear rhetorical structure and corresponding semantic associations, with provision for connections to existing experiences (schemata). Comprehension brings together the rhetorical, conceptual, and semantic perspectives in a dynamic mental entity that enables and organizes the writing task. The writer can then approach the task from various cognitive perspectives, but always with a clearly defined text as the starting point.

Assuming the availability of a target text, how does the process move ahead, based on the use of the conceptual elements presented thus far and with the focus on assessment of the written product? A text-based writing assessment can take three basic forms: summarization, extension, and transformation. Summarization highlights the key semantic elements in the text and reflects the text structure of the target text. Extension goes beyond summarization, including not only information from the target but also other relevant knowledge and experience. More than for summary, audience becomes critical in extension because the writer must select knowledge that is relevant to the designated purpose or reader of the text. Finally, transformation calls for creating a new construction from the original

information and extensions. An example might call for a student to consider the consequences if the Civil War had ended in a stalemate, or to weigh Jefferson's proposal that public schooling be required only through eighth grade.

Designing an authentic writing assessment requires consideration of the writer's knowledge base, the purpose of the exercise, and a clear explication of the task, if the aim is to ensure optimal performance by all students. Comprehension is the starting point of the process in this model, hence our detailed attention to the various treatments of this construct. Somewhat surprisingly, current discussions of the construct seem to lack grounding in the research of the previous few decades. The RAND study (Snow, 2002), for instance, focuses on reader, text, and activity, but does not consider lessons from schema theory, gives only passing attention to text structure, and makes no reference to semantic analysis. Similarly, the linkage between reading and writing, between comprehending and composing, between oral and written language—is not discussed. In the following section, we will attempt to demonstrate the value of the “conceptual kernel” as the basis for defining comprehension and for linking comprehension and composition.

Let us summarize the preceding background and set the stage for the remainder of the chapter with a concrete example: “Where do rocks come from?” Most young people know something about rocks, and they may have some ideas about their origins. Your assessment task is to delve into a student's understanding of this topic during an instructional activity. You begin with your expert “kernel knowledge” of the topic; we assume you approach assessment grounded in pedagogical content knowledge. Your task is to determine the student's initial understanding (fraught with intriguing preconceptions), and then track the transformations in this kernel as the student undergoes a course of study—a month-long unit on the rock cycle. The student produces artifacts along the way—discourse, written reports, and a final report. The assessment process can be couched in fairly traditional terms: a needs assessment (what does the student already know), formative evaluations (tracking the growth of knowledge), and summative performance (the final project). The model presented below combines substantive content with rhetorical structure, all bound together in the kernel. The ideal assessment provides an image of the student's understanding templated against the kernel during the project, to support assessment and instruction.

The Reading–Writing Connection

Ideas about reading–writing connections are not new, with origins in colonial times (Nelson & Calfee, 1998). In the past several decades, the two literacy components have been largely *disconnected* in U.S. classrooms. Yet process-based correlational studies suggest that reading and writing share underlying cognitive processes, that is, reporting (reproducing and paraphrasing), conjecturing, contextualizing, structuring, monitoring, and revising (Nelson & Calfee, 1998; Sperling & Freedman, 2001; Tierney & Shanahan, 1996). Some analyses emphasize the differences. For instance, the typical view is that readers absorb and organize information, while writers construct and express knowledge. The question, as Shanahan (1997) put it so pointedly, is whether the cognitive processes underlying reading and writing are sufficiently similar to allow for cross-learning opportunities yet sufficiently different to enhance learning? In particular, does processing information through reading

and writing increase chances of raising comprehension by providing distinctive cognitive perspectives on text and knowledge?

Our hypothesis is that the answer to Shanahan's questions is "yes." Research by Tierney, Soter, O'Flahavan, and McGinley (1989) showed (a) students who wrote prior to reading tended to read more critically than did students who were either involved in a background-knowledge activation task or were given a simple introduction to the story, and (b) writing together with reading prompted more thoughtful consideration of ideas than did writing alone, reading alone, or either writing or reading in combination with questions. Similarly, in *How Writing Shapes Thinking* (1987), Langer and Applebee found that writing in conjunction with reading prompts students to be more thoughtfully engaged in learning. They found that, for high schoolers, writing activities contributed to better learning than when reading was done without some form of writing, especially if the material was less familiar to the student. Additionally, the results supported Langer's 1986 study that different writing tasks prompted different kinds of cognitive engagement. For example, essay writing prompted the learner to focus more deeply on specific sections and led students to engage in a greater variety of reasoning operations than either note-taking or study guide questions. Overall, these studies confirm that learning through writing and reading deepens student comprehension and engagement. (See chapter 6, this volume, for further development of these ideas.)

Aside from cognitive processing, effective reading and writing are connected by a rhetorical, transactional, "cyclical" relationship. Writers, as they produce text, consider their readers. Readers, in turn, respond to what they perceive writers are trying to communicate, interpreting the text based on their own knowledge and experiences (Brown, Campione, & Day, 1981; Rosenblatt, 1978). To be sure, these interactions reflect an ideal that is not always realized in the classroom. Tierney, LaZansky, Raphael, and Cohen (1987) suggest that failure to understand the author's intention can cause problems in text comprehension. By studying the response of readers to inconsistent ideas, they found that better readers relied upon a consideration of an author's intent to comprehend meanings, a strategy that helped them with less familiar texts and texts without dialogue. Also, Salvatori (1986) argues that enhancing a sense of authorship can contribute to more critical thinking. College-level basic writers who had undergone a carefully developed sequence of writing experiences acquired a more "dialogical," or transactional, attitude toward reading than students who just "read" text. Salvatori's finding suggests that writing can enhance a sense of authorship and with it, comprehension skills, making readers more thoughtful as they critically approach meaning of texts through authors' intentions. These analyses are consistent with a view of deep, substantial, and purposeful comprehension as a (re)constructive process closely akin to composition.

This selection of studies from the field of reading-writing connections suggests that integrating reading and writing can have a beneficial impact on reading comprehension, can enhance writing performance, and can serve as a powerful tool for assessment design. Leading students to understand and practice processes that underlie both reading and writing offers possibilities for improving students' reading comprehension and writing skills. Instruction in the use of these cognitive processes and strategies provides a scaffold that equips students with the means and attitudes to become active learners and researchers rather than passive consumers of knowledge.

From Theory to Practice: Elements of Authentic Reading–Writing Assessment

We now turn to the practical elements of authentic reading–writing assessments. First is the classification of writing assessments into two basic formats: text-based and stand-alone assessments. Text-based assessments employ a reading sample or *target text* followed by the writing task or *writing prompt*. Stand-alone assessments consist of a writing prompt only, relying on students' prior knowledge as the basis for the composition. For reasons argued earlier, we think that large-scale, high-stakes writing assessments should be text-based, giving students the opportunity to extend and reconstruct information provided to all participants, and reducing experiential differences. Text-based assessments emphasize reading–writing connections, encouraging thoughtful analysis through writing, deepening a feeling for rhetorical structures through an enhanced sense of authorship and audience, and so forth.

Text-based writing assessments do pose particular challenges for assessment design: (a) selection of the target text, (b) development of the writing prompt, and (c) establishment of the reading–writing context. We will discuss the first two design elements and then move to the issue of constructing rubrics that assess not only writing ability, but also the actual transformation of ideas from reading into writing.

Target Text

Choice of the target text poses a host of challenges, some obvious, others more subtle. Reading level must be appropriate for the range of students. Vocabulary, both technical and “plain,” must be embedded in contexts that provide clues, enabling students to comprehend unfamiliar words or usages. Substitutions and paraphrasing may be necessary to provide sufficient explanations of concepts introduced. Layout features of the target text (font, type size, paragraphs, columns, word breaks) all must be examined for potential problems. Texts may help level the playing field, but they are by no means “culture free.” To the contrary (Kaplan, 1966), for example, recent immigrant students unfamiliar with American history may be at a disadvantage when asked to read a target text and write to a prompt about the importance of Sacagawea to Lewis and Clark's expedition. To be sure, students born in the United States who may have heard of Sacagawea's journey with Lewis and Clark may also have difficulty locating a “history” schema for processing the information.

Aside from content, schema theory suggests that text structures (narrative, compare–contrast, cause–effect, etc.) are important considerations for text selection. As examples, Driscoll (1994) and Halliday and Hasan (1989) note that readers' text structure schemata allow them to organize text information. To ensure that the target text supports student access to the information, the target text structure must “click” for students, providing memory slots into which the new information can be placed, establishing relations among the incoming elements. The assessment should include elements that facilitate students' linkage to the appropriate schema, through obvious devices such as headings or topic sentences, along with analogies, similes, and metaphors.

The choice of narrative versus expository genre for the target text can substantially influence writing performance. In high-stakes assessments through grade 3, the narrative genre is most common for reading and writing instruction and assessment. In our judgment, exposition offers advantages for assessing reading comprehension and writing ability, especially in the mid-elementary grades and beyond. Exposition rests not so much on everyday experiences but on academic, school-learned schemata that are more likely to reflect content area standards. Narratives are often the basis for cultural portrayals, which are important outcomes from schooling, but are more problematic as the basis for assessment activities. “Real-life” reading–writing demands are primarily in the expository genre, preparing students for future professional and social demands.

Writing Prompt

The structure and content of the writing prompt is critical in designing an authentic writing assessment. Our ongoing reviews of writing prompts in a variety of large-scale assessments at the national and state levels have revealed substantial design variations (Calfee, Miller, & Associates, 2002, 2004). In the Reading and Writing About Science Project (RWS) (Miller & Calfee, 2004b), we developed a set of guidelines for the construction of writing prompts based on the existing literature (Mathena, 2000) and in dialogue with teacher collaborators (Miller & Calfee, 2004a, 2004b). In brief, these guidelines call for the design of prompt structure around five elements—focus statement, identification of audience, type or form of writing, purpose for writing, and supporting details—to provide the student an optimum base from which a text can then be composed:

- Begin writing prompts with a focus statement, such as “You are learning about different kinds of rocks and how they are formed through the rock cycle process.” The focus statement has a twofold purpose: (a) it activates students’ prior knowledge, and (b) it models implicitly to students that thinking before writing is critical to writing a coherent and effective essay. Focus statements may be separated from the actual writing directive by placing them in separate paragraphs, folding over the sheet of paper, or using two separate sheets.
- Provide students with work space to create webs, weaves, or graphic organizers of their own design to help organize their thoughts prior to writing. This space may be provided between the focus and directive statements or on a facing page. A statement such as “You may use this space to plan your writing,” should be included in the prompt (or after it) so that students (a) are encouraged to develop a written organizer, and (b) know they are allowed to write in the blank space (obvious to us—but not to students accustomed to being told “don’t write in the book”). Younger students may be provided with an advanced organizer.
- Tell the students what specific form (also referred to as type) the writing is to take: a letter, paragraph, essay, article, or so forth. (Students should never be instructed to “write a paper.”)
- Offer specific and simple instructions about the purpose of the students’ writing. Use phrases such as the following:

“Write a story that tells...”

“Write an essay to explain...”

“Write a letter to convince...”

“Write a letter to persuade...”

- Tell the students who the audience is for the composition. Giving the students an idea of whom they are writing to or for gives them essential information about tone, vocabulary, and structure. It also makes the writing more real for students and encourages them to consider audience in their writing, and by extension, authorship in their reading.
- Emphasize the importance of supporting details and elaboration. In particular, inform the writer about the relative importance of text-based and background knowledge in the composition. The following messages can evoke quite different responses:

“Use your personal experience in your essay.”

“Keep the passage in mind as you write, along with your personal experience.”

The Role of Rubrics

To most effectively support student understanding and performance, the prompt should mesh closely with the rubrics used to evaluate the composition. Ideally, students should know the rubrics (i.e., what matters?), and should have learned how to digest a prompt in light of the expectations. For classroom exercises, these linkages are within the teacher’s control and can be built into the design of all assignments. Large-scale assessments tend to be more secretive, of course, which is understandable in some ways, though not others.

While many rubrics are available in the literature and are in practice in schools and assessment programs at the state and national level, our experience is that rubrics for content area writing present a unique challenge for assessment. First, all writing components, including grammar and spelling, must be addressed. Second, and of equal if not greater importance, the conceptual ideas relating to the content area must be rated and measured. It is for this reason that we believe that a “one-size-fits-all” rubric that addresses both the writing and the concepts is impractical and ineffectual. We have all read papers that are fluent, grammatically correct, and well written, but completely miss the point on the critical concepts. On the other hand, while some assessors assign a score of zero to all writing that is deemed “off-prompt,” we do not agree with this practice; a well-crafted essay, even if off-target, merits some recognition.

We have employed a five-rubric scale for writing assessment (cf. Miller & Calfee, 2004b), based on work originally done in Project READ (Calfee & Patrick, 1995) for measuring the traditional areas addressed by many writing assessments: length, coherence, grammar and mechanics, spelling, and vocabulary. It is important to note that spelling and vocabulary are separate elements. The importance of vocabulary in reading comprehension has been mentioned previously. Using new vocabulary in writing is an essential goal of text-based writing assignments. In our experience, spelling and vocabulary use in writing share an inverse relationship when examined by writing scores (as vocabulary

scores go up, spelling often goes down because more complex words are more difficult to spell). If students are not rewarded for taking risks with vocabulary usage (as is the case with many existing rubrics that consider spelling only), then they will simply not take the chance and thereby constrain their writing.

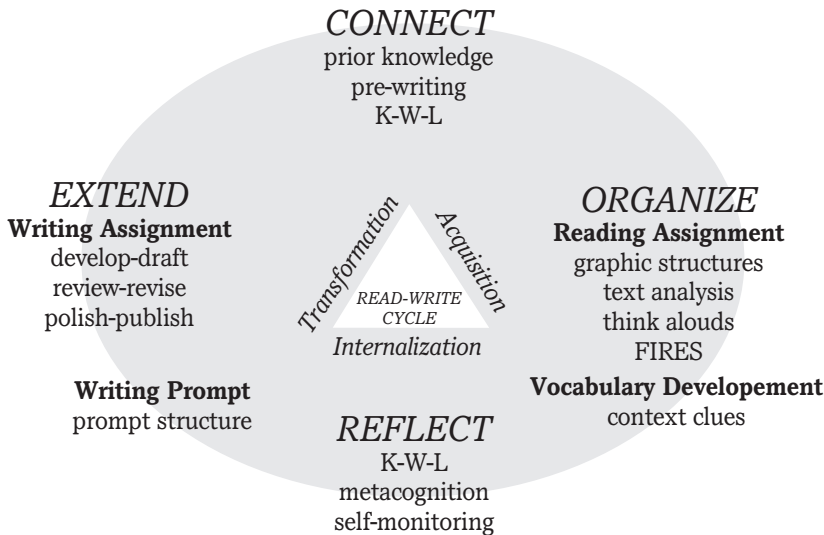
When student writing is based in content area knowledge, we advocate that a sixth rubric—content—be added to the evaluation process. We have found in the RWS Project that reliance on a coherence rubric as the sole indicator of successful expression of content knowledge through writing is insufficient and sometimes actually misleading. Therefore, a generic content rubric was developed to serve as the framework for evaluating content knowledge through writing, with the intent that specific content goals for each score level be developed for each assessment according to the writing prompt directive(s), content knowledge to be transmitted, and writing task assigned.

Finally, we reemphasize the importance of informing students about the rubrics and how they specify the skills and knowledge that are important. If students do not know what is desired or have no idea what a “great” paper looks like, then they are not likely to produce one. This idea is a variation of the “writing to models” approach from many years ago. It is important that teachers share with students (and that testing administrators and developers share with teachers) the goal statements for each level prior to the administration of the assessment, give students opportunities to read papers at various levels of achievement, and provide opportunities to discuss the reasoning underlying the papers’ scores. We have discussed the importance of student metacognitive reflection on their writing; by sharing the assessment framework long before requiring an on-demand writing task, students are enabled to construct papers that meet high standards.

Reading–Writing Context: Linking Assessment and Instruction

Authentic writing assessments function best not in isolation but when closely aligned with classroom instruction. To demonstrate their best performance on standardized writing assessments, students benefit from opportunities to develop well-established schemata for carrying out the reading–writing task in a variety of settings and subject matters, coupled with developmentally appropriate support and feedback along the way. Explicit instruction in reading and writing strategies at the classroom level (i.e., prewriting and metacognitive strategies, along with classroom and small-group interaction to activate background knowledge and schema) provides students with the cognitive schemata to display what they know during assessments.

The aim of this section is to explore the benefits of fusing instruction and assessment by describing the Read–Write Cycle (Miller & Calfee, 2004a), an integrated instruction and assessment model shown in Figure 12.1. The curriculum of the Read–Write Cycle utilizes varied reading comprehension strategies and text-based student writing as a vehicle to increase students’ reading comprehension and composition skills and, simultaneously, to assess students’ comprehension of texts as reflected in their writing. Although much is known about strategies for improving comprehension in controlled settings (Palincsar & Brown, 1984), less is known about translating existing research and instructional

Figure 12.1 The Read-Write Cycle

Adapted from Miller, R.G., & Calfee R.C. (2004a). Building a better reading-writing assessment: Bridging cognitive theory, instruction, and assessment. *English Leadership Quarterly*, 26(3), 6-13. Copyright 2004 by the National Council of Teachers of English. Used with permission.

techniques into classroom activities that impact large-scale reading and writing assessments (see also Wilson, 2004).

The Read-Write Cycle combines the techniques of the CORE Model (Chambliss & Calfee, 1998), the California Learning Assessment System (CLAS) (Underwood, 1999), and varied reading comprehension and writing strategies in the domain of expository text, where we refer to both the prose and figural representations typical of exposition. Metacognitive reflection is emphasized throughout the model, and reading comprehension is assessed continually by both oral and written methods. Individual activities within the Read-Write Cycle provide practical models for classroom teachers for planning and implementing research-based reading and writing instruction.

We developed the Read-Write Cycle in response to the following challenge: How do we translate what we know from research on reading comprehension into a generalizable instructional method that teachers are willing to implement, able to internalize, and can apply across subject areas and grade levels? To be feasible and successful, such educational strategies must be efficient (they cannot require enormous amounts of time and money), effective (they must apply to a broad range of texts, grade levels, and subject areas), and adaptable (teachers can employ the strategies within the same classroom for a range of students, from gifted to special education).

To illustrate the Read-Write Cycle in practice, we will draw on an example from the RWS Project. During an introductory lesson from the Connect phase on the rock cycle, for example, the teacher first identifies for students what they will be studying (in this case, different kinds of rocks and how they are formed). Teachers activate students' prior topic knowledge, or specific topic background

knowledge (Alexander, Schallert, & Hare, 1991), and existing schema by having them actively reflect, share with others, and use prewriting (Tierney et al., 1989) and K-W-L (What I Know-What I Want to Know-What I Have Learned; Carr & Ogle, 1987) as focusing techniques. Students write down and share their knowledge and experiences in both whole-class and small groups regarding different kinds of rocks and their origins, and they make predictions about the content of the upcoming reading sample.

Meaning is not inherent in text but constructed as readers transact with the text and draw upon their knowledge and experiences to make sense of it (Brown, Campione, & Day, 1981; Rosenblatt, 1978). Having students share their prior knowledge in class not only increases students' reading comprehension, but also assists the teacher in identifying the academic experience of the class as a whole, including particular preconceptions held by the students. For example, during the rock cycle unit's introductory lesson, a fourth-grade student shared with the class that "rock cocaine" was derived from rocks. The teacher gently corrected the student's confident claim.

During the Organize phase, students (a) read the reading sample on the stages of the rock cycle (igneous, sedimentary, metamorphic), use think-aloud strategies when reading individually, and conduct analysis of text structure, purpose, and audience; (b) organize their pre- and post-reading ideas using graphical structures (e.g., web, matrix, linear string, or FIRES [Facts, Incidents, Reasons, Examples, Statistics]); and (c) apply contextual clues in the text to translate new and unfamiliar vocabulary—all of these activities done individually, in small groups, and through whole-class discussions. Graphic organizers have been shown to aid in reading comprehension and writing ability (e.g., Calfee & Drum, 1986). In the RWS Project, we found that matching the type of graphic organizer (e.g., falling dominoes, web) to the type of text (for example, sequential, descriptive) maximized the effect of the organizer on writing coherence. The match seems to help students arrange the new information received from the reading into an existing text-structure schema (for example, compare-contrast, narrative), thus aiding comprehension. Note that graphic organizers are not given to the students; rather, the students, with teacher guidance, actively create them. Students are asked to justify their organization of the content matter into the graphic structures during the process. This active creation of the organizer further strengthens the student's metacognitive and reasoning ability and enables students to choose which type of organizer "works" best for a given situation (Chambliss & Calfee, 1998). In a target text on the stages of the rock cycle, for instance, students often organized their information into a format that we describe as a sequential web; each stage in the cycle was represented by a cluster on the web, and the stages were then linked to each other with arrows representing transformations from one stage to another.

After reading the text sample during the Reflect process, students examine their graphic organizer's structure and content and make revisions as necessary. Students may discard, reorder, or restructure ideas they had during prewriting. Prewriting ideas may prove incorrect, inaccurate, or simply irrelevant to the reading. Students share their reflections on the reading both in small groups and with the teacher. K-W-L (Carr & Ogle, 1987) serves again during reflection to further solidify students' reflections on the content knowledge.

Between Reflect and Extend, the teacher introduces students to the writing prompt. Students also reflect on the writing assignment. The RWS writing prompts follow the guidelines described earlier, and students are taught how to “dissect” the prompt into its constituent elements to help locate key ideas from the reading, and to translate the information into a coherent compositional structure. Here is the prompt from the introductory lesson of the rock cycle unit:

You are learning about different kinds of rocks and how they are formed through the rock cycle process. Although rocks can have many differences, they all are related to each other through the rock cycle.

Suppose you want to explain to your parents about the rock cycle. Write to explain (a) what the rock cycle is, (b) what the different kinds of rocks formed by it are, and (c) how the rocks can be changed from one kind into another. Use paragraphs to group your ideas and make sure your writing has a clear beginning, middle, and end. Use as many details and examples from what you have read to explain your ideas clearly and completely.

Students identified the audience (parents), type of writing (paragraphs), purpose (writing to explain), and the source of the supporting details (reading sample).

The final task is the individual composition, which occupies the Extend phase. This task provides an opportunity for individual students to synthesize their knowledge and transform it into new shapes and for new applications. This “extension” is performed individually, with little or no assistance from peers or the teacher, as during a regular assessment. Students go through the traditional phases of the writing process (develop, draft, review, revise, polish, publish) while composing. Once the paper is completed, RWS students typically have an opportunity to share their writing with other audiences—peers in small or large groups, the “public” (which means posting the papers outside the classroom), or their parents—raising the level of relevance of the assignments and providing valuable feedback to students on the effectiveness of their efforts.

Closing Thoughts

The No Child Left Behind (NCLB) era confronts everyone in the educational enterprise with high-stakes punitive outcomes, modest rewards, and limited resources. Depending on the regional context, the consequences and demands descend from administrator to teacher to student. The one constant in the federal program, mirrored in many state programs, is the emphasis on externally mandated testing. Ralph Tyler (1950), who fathered the concept of national assessment, might be surprised at these developments. Current policies and practices, driven by bureaucratic more than educational considerations, emphasize cost (cheaper is better), standardization (flexibility and accommodation are to be minimized), and central control (disconnection from the classroom curriculum). The consequences are substantial for students (diploma denial, retention, summer school), for teachers (mandated in-service activities and imposed classroom activities), and for administrators (especially for principals, whose positions rise or fall with yearly spikes in average test scores). These practices and policies, popular though they may be, fly in the face of international research showing the

limitations of externally mandated testing and the benefits of authentic instruction and performance-based assessment.

The message in this chapter revolves around national trends that (a) emphasize reading comprehension and (b) neglect writing assessment. These trends are understandable. Multiple-choice comprehension tests are easy to construct and cheap to administer. Writing assessments are expensive, “subjective,” and difficult to control—all features certain to provoke bureaucratic distress. The typical response is to limit the number of grades tested and to standardize the task through “on-demand” procedures, constrained rubrics, and minimal weighting of this domain in decisions.

The Read-Write Cycle approach presented in this chapter provides a valid strategy for linking reading, writing, and language development while also offering opportunities for assessment in the equally neglected content areas of science and social studies. One might question the workability of the model, especially as it proposes demanding instruction for all students. In fact, some reviewers have criticized the model as being too demanding for students of lower achievement levels, despite documented success with such students (Miller & Martinez, 2004). In the RWS Project, we have applied Robert Maynard Hutchin’s premise that “the best education for the best is the best education for all” (as cited in Adler, 1982, p. 6).

Our programmatic focus is on the classroom teacher’s crucial role in the implementation of cognitively demanding, transformative instruction and assessment as prescribed by the Read-Write Cycle. The National Reading Panel (National Institute of Child Health and Human Development, 2000) reports that the preparation of teachers is intimately linked to students’ achievement in reading comprehension but then bewails the lack of research-based evidence on this issue. Hence, the central question: What do teachers need to know in order to produce lasting improvement in students’ reading comprehension and writing ability? We propose that elementary and nonlanguage arts teacher specialists do not need intimate knowledge of the research on reading and writing instruction to raise reading comprehension and writing skills. Rather, they need to know a few things well, such as understanding how different reading and writing skills can be combined and used in context to improve reading comprehension, how to communicate what they know to their students, and how to reflect on and improve their teaching. Central to these activities is the “assessment schema” that guides the teacher through the daily and weekly complexities of the classroom.

Of course, the consequence of this requirement for good teaching is the need for ongoing professional development to enable teachers to tailor their knowledge and skills to particular demands. It has been our finding, during implementation of the RWS project, that relatively little time (three to five days of inservice training, implemented in various formats, ranging from hour-long sessions to concentrated full-day programs) can be highly effective in teaching teachers the components of the Read-Write Cycle, and in assisting them to develop lessons of their own around “scripts” that incorporate these elements. To address the task of constructing authentic writing assessment, from start to finish, appropriate and supportive professional development of teachers must be addressed and provided. The challenge, of course, lies with emphasizing professional development versus “program training,” where teachers learn to implement a prescribed program. The key here is control—professionals exercise independent judgment and resist efforts to override their autonomy as individuals and collectives. If the goal is a cadre of

workers who follow instructions to produce graduates who possess basic skills, then training is the appropriate model. A different vision highlights the concept of “high standards for all students,” which requires professionals capable of informed decisions and accountable for meeting the societal ideals of quality and equity. The practical challenge, in this age of assessment, is to develop models that can move school communities from where “we” are to where “we” would like to be.

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